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CONTENTS

Gunder—North American Institutions Featuring Lepidoptera—XI . . . 31
The New Biological Laboratories at Canberra, Australia 33
Bruton—Philip Henry Gosse's Entomology of Newfoundland 34
Fulton—A New Species of Nemobius from North Carolina (Orthoptera: Gryllidae) 38
Hebard—Additional Data on Nemobius sparsalsus Fulton (Orthoptera: Gryllidae, Nemobiinae) 42
Brower—An Experiment in Marking Moths and Finding them Again (Lepid.; Noctuidae) 44
Imschweiler—An Appreciative Subscriber 46
Knight—Recognition of Lygus lucorum Meyer from North America (Hemiptera, Miridae) 47
Cockerell—A Fossil Dragon-fly from California (Odonata: Calopterygidae) 49
Hilton—Another Genus of Protura in California 51
Possible Light on Geographic Distribution of Insects 52
Van Duzee—New Species of Dolichopodidae from North America (Dip.) 53
Editorial—Entomology at the Convocation Week Meetings, December 27, 1929, to January 2, 1930 56
Entomological Literature 58
Obituary—Rev. Alfred Edwin Eaton, Frank Hurlbut Chittenden, James Walker McColloch, George F. Gaumer 63

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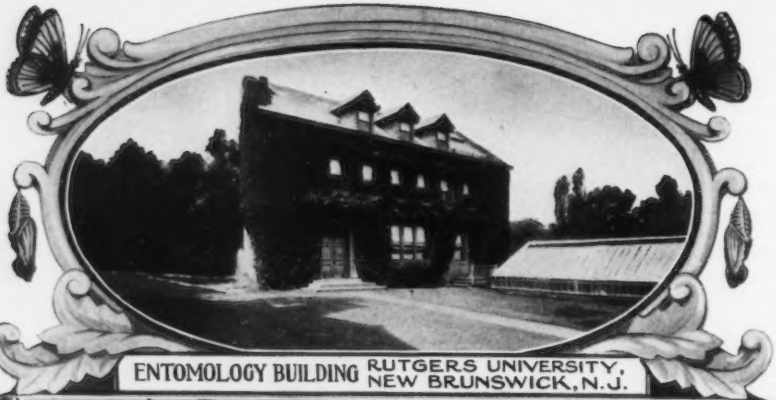
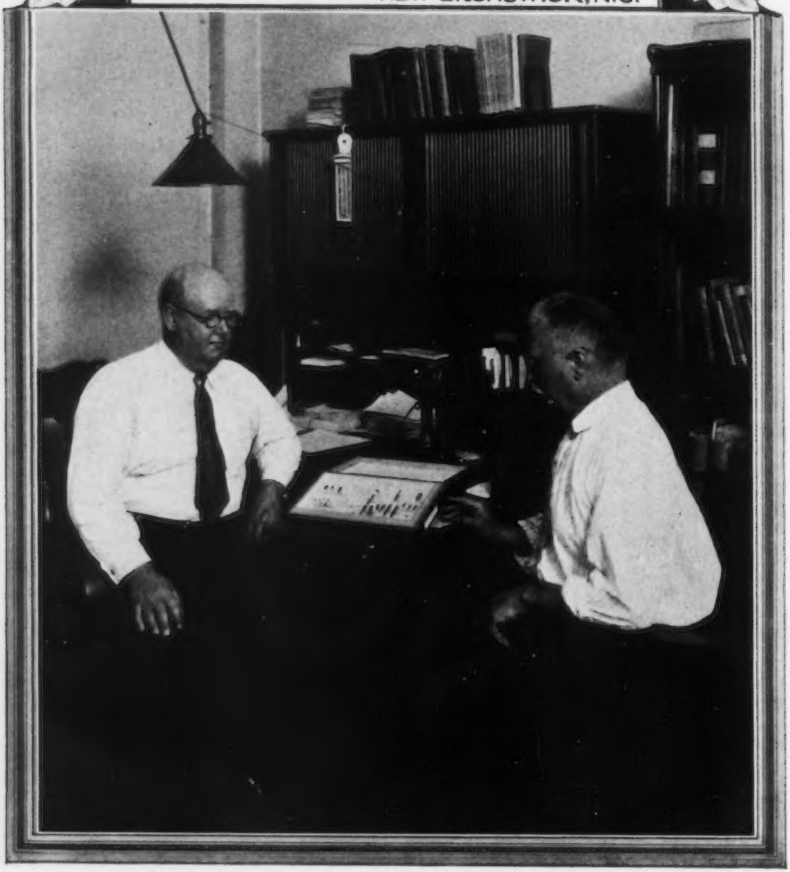
Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

The printer of the "News" will furnish reprints of articles over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 35 cents; three or four pages, twenty-five copies, 70 cents; five to eight pages, twenty-five copies, $1.40; nine to twelve pages, twenty-five copies, $2.00; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be at the corresponding multiples of these rates.



ENTOMOLOGY BUILDING RUTGERS UNIVERSITY, NEW BRUNSWICK, N.J.



DR. THOMAS J. HEADLEE CARL ILG

ENTOMOLOGICAL NEWS

VOL. XLI. FEBRUARY, 1930 No. 2

North American Institutions featuring Lepidoptera.

XI. Rutgers University, New Brunswick, New Jersey.

By J. D. GUNDER, Pasadena, California.

(Plates IV, V.)

It is interesting to note that the principal colleges and schools in United States where entomology is seriously taught are non-sectarian. There is not much danger, therefore, of direct interference by certain classes of anti-evolutionists, so far as it may concern the study of insects.

Rutgers University at New Brunswick is the State University of New Jersey and was founded in 1766 by the former Protestant Dutch Church of America. It is one of the old colonial colleges and its history is set forth in a book entitled, "History of Rutgers College" published by Dr. Wm. H. Demarest in 1924. Like most of the old seats of learning, it is supported by accumulated private funds with occasional State and Federal aid. The school is situated on an original site of some thousand acres and occupies more than two hundred buildings, many of which are modern, while the majority are small and of the old stone and brick type, though quite suited for their purposes. The enrollment for 1929 was over nine thousand. The University divides its activities among six branches, called; the College of Arts and Sciences, the College of Engineering, the College of Pharmacy, the College of Agriculture, etc.

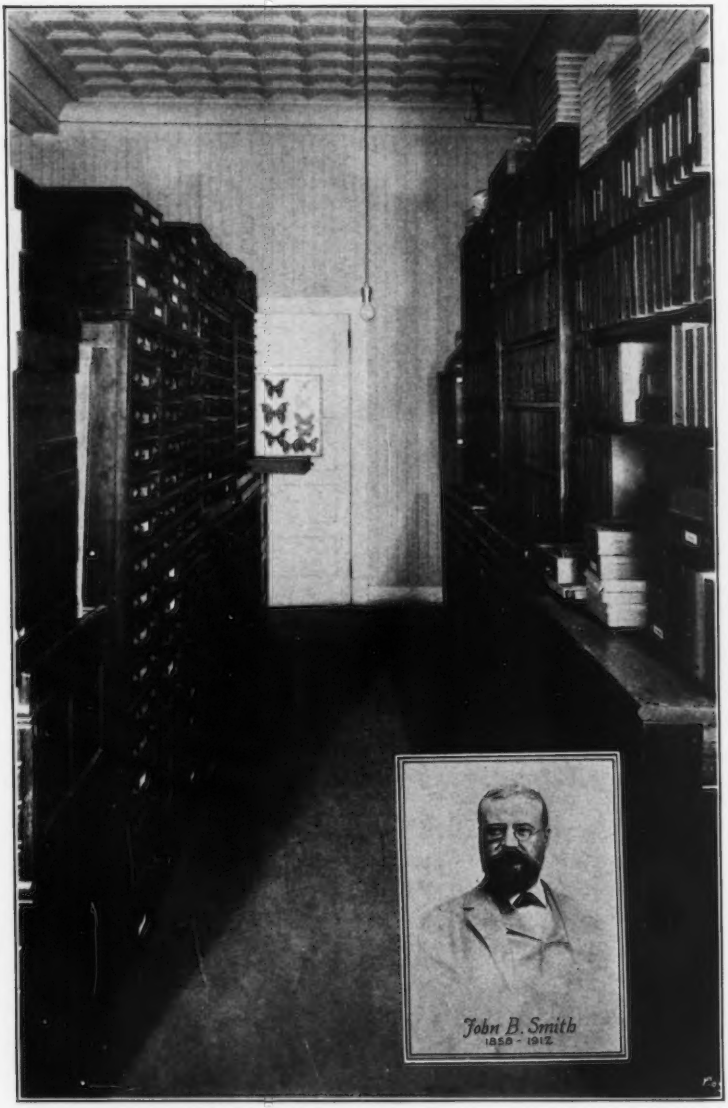
Of interest to lepidopterists is the Department of Entomology in connection with the College of Agriculture, because it was here that Dr. John B. Smith, Rev. Geo. Hulst and others developed their work and deposited their collections. Hulst instigated the first entomological studies in 1888. He was an alumnus of the Class of 1866 and when he died his collections of butterflies and moths were left to the school. Though many of his types are now in Washington, the bulk of his collections remain as he left them. Smith first came to Rutgers in 1889

and proceeded to organize the Entomological Department along educational lines, becoming its first professor in charge. At the same time he was appointed entomologist for the New Jersey Agriculture Experimental Station. Later, in 1898, his work merited the office of Chief State Entomologist. Dr. Smith was with the University up until the time of his death in March, 1912,[1] and probably his outstanding accomplishment was in the Noctuidae of which he described the types of many new species, adding approximately 800 to the collection. Smith's two Check Lists of Lepidoptera (1891 and 1903) are well remembered, but of course are long since out of date. His "Explanations of Terms used in Entomology" is still unique and no one seems willing to attempt a newer revision.

Dr. Smith did outstanding work in the field of economic entomology as well, bringing about the control of the San Jose scale. It is due to his research that miscible oils were placed on the market, as a means of controlling this and other scale insects. He accomplished the passage of the first insect laws in his state and his mosquito control work stands as a model for similar efforts elsewhere.

Plate V shows the collections as they appear today. They are well kept and in good order. Most of the Noctuidae are in the uniform cabinets to the left in the picture. Some day some one will segregate the type specimens, but whoever does this should know his business, otherwise the collection should be left as it is. There are about 30,000 lepidopterous specimens altogether. Aside from Smith's material there are about 100,000 mounted specimens in all orders in the Department's collection, as follows: 35,000 Coleoptera; 14,000 Hymenoptera; 4000 Hemiptera; 4000 Diptera; 1400 Orthoptera and representatives in other Orders in proportion. Although no new types have been added of late years, there is always that hope. However, the bulk of the collection is gradually increasing in size. Miss Augusta Meske, who is Dr. Smith's sister-in-law, is still an Assistant Entomologist in the Department. I understand there are 55 students taking a straight course in entomology at the present time.

[1] See obituary in May, 1912, ENTOMOLOGICAL NEWS; also notice in May, 1912, *Canadian Entomologist*, by Mr. Arthur Gibson.



An aisleway in the Entomology Building showing
Dr. Smith's collections as they look today.

Dr. Thomas J. Headlee was appointed to fill the vacancy caused by the death of Dr. Smith and he is shown on the accompanying Plate IV seated at his desk in conference with Mr. Carl Ilg. Dr. Headlee received his A.B. and A.M. at the University of Indiana and his Ph.D. at Cornell University. While interested generally in insect physiology, most of his studies have been along the lines of strict economic entomology and he has published more than 170 articles in various kindred journals. Among his first papers, though probably not his most important, was "A Study in Butterfly Wing Venation, with Special Regard to the Radial Vein of the front Wing", Smithsonian Miscellaneous Collections, 1907. A recent paper of interest appearing in the March, 1929, Jour. N. Y. Ent. Soc. is titled "Some Facts Relative to the Effect of High Frequency Radio Waves on Insect Activity". This article is in co-authorship with R. C. Burdette.

Every lepidopterist who goes to Rutgers to study the collections meets and knows Carl Ilg. Mr. Ilg has been with the Department as Laboratory Assistant since 1921 in charge of the insects and exhibit material. His special hobby is the making of minature insect habitat groups. I have seen several of these little exhibit cases and they are truly clever. Mr. Ilg should be encouraged to pursue his talent along this line. Many museums and schools might be interested in such products. Mr. Ilg was born in Wurttemberg, Germany, and worked for a while at Cornell University.

The New Biological Laboratories at Canberra, Australia.

Dr. R. J. TILLYARD, the Commonwealth Entomologist, wrote to the editor of the NEWS on November 26, 1929: Our fine new Laboratory Building, which should have been ready by July, is still not complete, but we are in possession of half the ground floor. . . . We hope to be in possession of the entire building by January 1st, and we have also two fine new insectaries in good working order. Next year there will still remain the big central Administrative Block and the Botanical Laboratory to be built. . . . So we shall not be completely installed until December, 1930, or even later.

Philip Henry Gosse's Entomology of Newfoundland.

Introductory Note by F. A. BRUTON, M.A., Litt.D.,
27 Clevedon Rd., Weston-super-Mare, Somerset, England.

Philip Henry Gosse, the English Naturalist, landed at Carbonear, in Newfoundland, in the year 1827, when he was seventeen years old; and for some eight years he was employed in a shipping firm in that country. In May, 1832, he purchased a copy of Adams's "Essays on the Microscope" at a sale at Harbour-Grace, and of that year he wrote: "In 1832 I commenced that serious and decisive devotion to scientific Natural History which has given the bent to my whole life."

In 1835 he left Newfoundland, and bought a farm at Compton in Canada. Here, in the following year, as his biographer tells us, he wrote his first book, entitled: "Entomologia Terrae Novae", which has never been published. Early in 1839 he returned to England, and on the voyage he wrote his "Canadian Naturalist", which was published in London in the next year, and had a favorable reception.

In response to a number of requests from Canada and Newfoundland, the late Sir Edmund Gosse searched carefully, but without success, for his father's "Entomologia Terrae Novae". Since Sir Edmund's death, however, the volume has been found by his son, Dr. Philip Gosse. In a small book, with between sixty and seventy pages, there are nearly two hundred and fifty beautiful hand-painted figures of insects, larvae, and pupae, and the pages are headed, in very faint pencil, more or less according to the list of orders and genera given in the twelfth edition of Linnaeus's "Systema Naturae."

In this connection, it may be interesting to quote a few sentences from the author's preface to his "Manual of Marine Zoology", published many years afterwards. There he says:

> It is now about twenty-four years ago that, in a land far remote from this, I began the study of Systematic Zoology with Insects.
>
> In my ignorance, I attacked it entire and indivisible—collecting and trying hard to identify everything that I found, from the Cicindela to the Podura.
>
> I had not an atom of assistance towards the identifications, but the brief, highly condensed, and technical generic characters of Linnaeus's "Systema Naturae"; over which I puzzled my brains, specimens in hand, many an hour.

At the beginning and end of the book, very faintly pencilled, are long lists of insects, which seem to be of the nature of memoranda. One list is headed: "Insects described but not painted herein." The book, however, contains no descriptions whatever, and we can only conclude that the intention was frustrated by other duties. That a wide field is covered may be seen from the list that follows. The pictures evoked the admiration of the experts at the British Museum.

With the consent of Dr. Philip Gosse, I took the book to the British Museum (Natural History) at South Kensington, in March, 1929, and there Major Austen, D.S.O., who is the Keeper of Entomology, very kindly arranged that I should submit the book in turn to the Heads of the various Sections under his direction. I must here acknowledge, most gratefully, the great kindness of Major Austen and the following members of his Staff, who spared no pains in the attempt to identify and classify the Insects figured in the book. The names are:

Mr. G. J. Arrow and Mr. K. G. Blair, (Coleoptera); Mr. W. E. China and Mr. R. J. Izzard, (Hemiptera); Captain N. D. Riley, Mr. W. H. Tams, and Mr. H. Stringer, (Lepidoptera); Mr. D. E. Kimmins, (Neuroptera); Dr. Waterston, Mr. R. B. Benson, and Dr. Charles Ferrière, (Hymenoptera); and Miss D. Aubertin and Mr. F. W. Edwards, (Diptera).

Some of the figures are named, but hardly any of these names would stand now; a few had been re-named by Mr. W. H. Edwards in 1882. English names ("Banded Veneer", etc.) had been appended to a number of the moths.

ENTOMOLOGIA TERRAE NOVAE

PHILIP HENRY GOSSE

List of Insects Figured, Pages 1 to 61.

ORTHOPTERA

ACRIDIDAE: *Melanoplus* sp.

DERMAPTERA

FORFICULIDAE: *Forficula* sp.

EPHEMEROPTERA

Three larvae of *Ephemera.*

ODONATA

GOMPHIDAE: *Gomphus* sp. AESCHNIDAE: *Aeschna* 2 spp. CORDULIIDAE: Two specimens. LIBELLULIDAE: *Libellula quadrimaculata* Linn. LESTIDAE: One specimen. AGRIONIDAE: Two specimens.

THYSANOPTERA

Thrips, sp.

HEMIPTERA

PENTATOMIDAE: Doubtful genus pencilled *Cimex*. LYGAEIDAE: *Eremocoris ferus* Say. MIRIDAE: *Calocoris norvegicus* Gmelin. GERRIDAE: *Gerris remigis* Say. CORIXIDAE: One specimen, probably *Arctocorisa* sp. (pencilled: *Notonecta*). CICADELLIDAE: *Deltocephalus configuratus* Uhler, *Draeculacephala angulifera* Walker or *noveboracensis* Fitch, *Evacanthus acuminatus* Fabricius.

NEUROPTERA

HEMEROBIIDAE: *Hemerobius* 2 spp.

TRICHOPTERA

LIMNOPHILIDAE: *Limnophilus* sp. Another specimen.

LEPIDOPTERA

Classified according to the Check-List of Lepidoptera of Boreal America: by Wm. Barnes and J. Mc. Dunnough.

RHOPALOCERA—PAPILIONIDAE: *Papilio glaucus canadensis* R. & J., *P. polyxenes brevicauda* Saunders. PIERIDAE: *Pieris napi* (*frigida* Scud.) gen. aest. *acadica*. Edw. NYMPHALIDAE: *Aglais milberti* Godt., *A. antiopa* Linn., *Vanessa atalanta* Linn., *Vanessa cardui* Linn. SATYRIDAE: *Oeneis chryxus calais* Scud., *Coenonympha inornata* Edwards. LYCAENIDAE: *Heodes epixanthe* Boisduval, *Plebeius scudderi aster* Edw., *Pl. aquilo* Boisduval, *Glaucopsyche lygdamus couperi* Grote.

HETEROCERA—NOCTUIDAE: *Euxoa* sp., *Agrotis plecta* Linn., *Lycophotia occulta* Linn. *Xylena nupera* Lintner, *Trachea finitima* Guenée, *Agroperina cogitata* Smith, *Eremobia claudens* Walker, *Hyppa xylinoides* Guenée, *Apamea nictitans* Linn., *Autographa brassicae* Riley, *A. putnami* Grote, *A. bimaculata* Stephens. LYMANTRIIDAE: *Notolophus antiqua* Linn. GEOMETRIDAE: *Rachela bruciata* Hulst, *Calocalpe undulata* Linn., *Dysstroma cervinifascia* Walker, *Eulype hastata* Linn., *Meso-*

leuca ruficiliata Guenée, *Lygris propulsata* Walker, *Eufidonia notataria* Walker, *Bapta vestaliata* Guenée, *Itame sulphurea* Packard, *I. subcessaria* Walker, *Pero honestarius* Walker. PYRALIDAE: *Crambus agitatellus* Clemens, *C. topiarius* Zeller, *C. innotatellus* Walker, *C. trichostomus* Christoph, *Evergestis straminalis* Hüb., *Phlyctaenia itysalis* Walker, *Pyrausta orphisalis* Walker. TORTRICIDAE: *Tortrix* sp. EUCOSMIDAE: *Epiblema* sp., *Olethreutes dealbana* Walker, *O. capreana* Hübner, *Ancylis biarcuana* Stephens. OECOPHORIDAE: *Depressaria* sp. (near *applana* Fab.), *Dasycera* sp. (near *sulphurella* Fab.). PTEROPHORIDAE: *Platyptilia carduidactyla* Riley.

COLEOPTERA

CARABIDAE: *Sphaeroderus lecontei* Dej., *Notiophilus aquaticus* Linn., ? *Agonum* or ? *Platynus* (probably *Platynus cupripennis* Say.), *Carabus maeander* Fisch., *Loricera pilicornis* Fab. DYTISCIDAE: ? *Agabus*, ? *Hydroporus*. GYRINIDAE: *Gyrinus* sp. STAPHYLINIDAE: *Creophilus maxillosus* Linn. SILPHIDAE: *Necrophorus* ? *mortuorum* (Note: *mortuorum* is recorded from Nfld.). BYRRHIDAE: *Cytilus sericeus* Forst. (Nfld.). COCCINELLIDAE: *Coccinella trifasciata* Linn., *Adalia bipunctata* Linn. TELEPHORIDAE: *Telephorus* sp. ELATERIDAE: *Corymbites pictus* Cand., *C. triundulatus* Rand., *C. kendalli* Kirby. MORDELLIDAE: *Mordella* sp. PYROCHROIDAE: *Dendroides concolor* Newman. CEPHALOIDAE: *Cephaloon lepturoides* Hald. APHODIIDAE: *Aphodius fimetarius* Linn. CERAMBYCIDAE: *Criocephalus agrestis* Kirby, *Leptura* ? *laeta* Leconte, *Evodinus monticola* Rand. HALTICIDAE: *Phyllotreta vittata* Fab., *Chaetocnema* sp. CURCULIONIDAE: *Otiorhynchus* ? *sulcatus* Fab., *Orchestes* sp., *Sitona* 2 spp., *Notaris* ? *aethiops* Fab. or *puncticollis* Lec. (Nfld.), *Pissodes notatus* Fab., *Calandra* ? *granaria* Linn. or *oryzae* Linn. SCOLYTIDAE: *Dendroctonus rufipennis* Kirby.

HYMENOPTERA

TENTHREDINIDAE: Three larvae, *Cimbex violacea* Kirby, *Trichiosoma* (larva only), *Trichiosoma* sp. SIRICIDAE: *Urocerus albicornis* Fab. (female), *U. flavicornis* Fab. (male and female), *Sirex abbotii* Kirby (male), *S.* ? *cyaneus* Fab. (fe-

male). ICHNEUMONIDAE: (as numbered by Gosse): 1. *Coelichneumon coeruleus* Cresson (female), 2. *Ichneumon* sp. (male), 3. *Henicospilus* sp. (female), 4. *Ctenichneumon* sp. (female), 5. *Ephialtes* sp. (female), 6. *Ichneumon* sp. (male), 7. *Ctenichneumon* sp. (male). CLEONYMIDAE: one figure (not *Chalcis* as marked). FORMICIDAE: *Formica or Camponotus* (an alate form). CHRYSIDIDAE: *Chrysis* sp. VESPIDAE: *Vespa* sp., *V. maculata* Linn., *Odynerus* sp. CRABRONIDAE: *Crabro* sp. APIDAE: *Nomada* sp.

DIPTERA

TIPULIDAE: *Pedicia albivitta* Walker, *Eriocera spinosa* Osten Sacken, *Tanyptera dorsalis* Walker. PTYCHOPTERIDAE: *Bittacomorpha clavipes* Fab. STRATIOMYIDAE: *Stratiomyia laticeps* Loew, *Oxycera* sp. TABANIDAE: *Chrysops* sp., *Tabanus zonalis* Kirby. ASILIDAE: *Laphria lasipus* Wiedemann. SYRPHIDAE: *Volucella ? erecta* Walker, *Syrphus* sp.

THE END.

A New Species of Nemobius from North Carolina (Orthoptera: Gryllidae).[1]

By B. B. FULTON, N. C. State College, Raleigh, North Carolina.

Nemobius sparsalsus[2] new species.

This species was found in a strip of marsh grass, *Spartina stricta,* bordering a shallow sound near Carolina Beach, sixteen miles south of Wilmington, North Carolina. Its presence was detected by its distinctive type of song.

Type; female; Carolina Beach, N. C., Sept. 12, 1928. *Types* deposited in the U. S. National Museum.

Size large for the genus. Head as wide as pronotum. Eye 1.4 times as long as wide. Length of segments of maxillary palpus as follows: third 1.0 mm., fourth .7 mm., fifth 1.5 mm. Diameter of fifth segment increases gradually to tip which is slightly obliquely truncated; diameter at tip .35 mm. Pronotum 2.6 mm. long; greatest width at middle 3.4 mm.; slightly narrower at anterior and posterior margins; median line impressed; covered with fine brown pubescence and scattered black bristles. Tegmina cover about half the abdomen; dorsal

[1] Published with the approval of the Director of Research as Paper No. 35 of the journal series.

[2] From *Spartina,* marsh grass and *salsus,* salt.

field obliquely truncated; intermediate channel rather wide, distally narrowing to three-fourth of width at middle. Dorsal field of right tegmen with three complete veins, the external one forked, and a fourth nearly complete vein. Dorsal field of left tegmen with only one complete vein, which is forked, and a vestigial second vein. Hind tibia four-fifths and tarsus three-fifths the length of the femur. Spurs and spines of hind tibia unusually long for the genus; disto-ventral spurs very unequal in length; the longest inner spur (2.9 mm.) reaches the base of the disto-internal spur of the metatarsus; disto-internal spine nearly equals longest spur (2.7 mm.). Ovipositor slightly shorter than hind femur; with a slight but distinct curve about the distal third; upper edge nearly straight at tip, with low rounded teeth; extreme tip of upper rods obliquely truncated.

Color nearly uniform dark sepia, becoming nearly black on occiput, pronotum, dorsal field and upper portion of lateral field of tegmina. Proximal portion of hind femora lighter sepia. Faint trace of four lighter longitudinal lines on occiput.

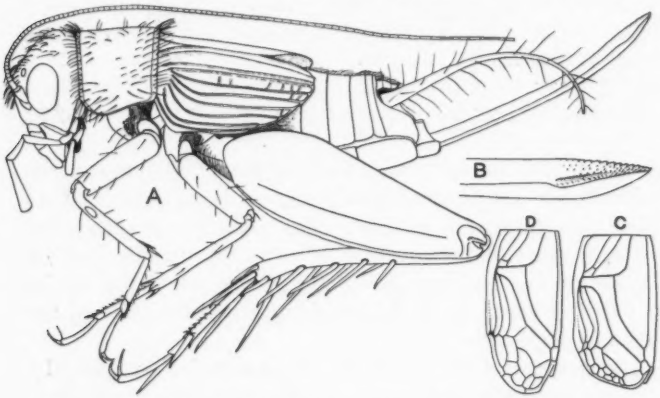


Fig. 1. Nemobius sparsalsus, new species. A. Lateral view of type. B. Enlarged view of tip of ovipositor. C. Dorsal field of tegmen of allotype. D. Same of N. fasciatus socius from Wilmington, N. C.

Exposed abdominal tergites each with pair of small slightly lighter blotches at level of cerci. Ovipositor black, tip dark reddish brown. Maxillary palpi sepia, distal portion of fifth segment darkest. Head, pronotum and tegmina shiny.

Allotype; male; same data as type. Similar to female in general structure and color. Tegmina broad and cover a little more than half the abdomen; distal margin of dorsal field broadly curved and oblique, apical area broader than long;

longest part of dorsal field near the fold and but little longer than lateral field. Proximo-internal spine of hind tibia specialized as in other native species.

Tegmina entirely dark sepia including all the veins. Exposed abdominal tergites black with fine brownish pubescence, concealed tergites shining black. Sixth and seventh abdominal tergites with paired obscure lighter spots at level of cerci.

Paratypic series; seven females, five males; same data as type. All of the females have the stout, slightly curved ovipositor with minutely truncate tip. All males have the obliquely truncated tegmina. No long-winged forms are present. With the exception of one female, the general coloration is dark sepia to black. In the exception noted all parts except the dorsum of abdomen and ovipositor are medium sepia, slightly mottled on head and pronotum but otherwise uniform. Dorsum of abdomen blackish and shows two paired rows of obscure lighter blotches on the exposed tergites, the additional rows above the level of the cerci. Measurements in millimeters:

	Pronotum Length	Tegmen	Hind Femur	Hind Tibia	Ovipositor
Type	2.6	4.4	8.4	6.8	7.5
Allotype	2.3	5.0	7.6	6.2 -	
Paratypes					
Females	2.1-2.6	3.6-4.7	6.8-8.5	5.5-7.0	6.4-7.5
Males	2.0-2.3	4.0-5.0	6.5-7.6	5.3-6.2	

Comparisons: The spurs and spines of the hind tibiae are relatively longer and in the larger specimens actually longer than those of any species examined. The minutely tuncated tip of the upper rods of the ovipositor is a distinct character and on account of the mucky nature of the ground where the species is found, it could hardly be due to wear from the use of the organ in oviposition.

The species is distinct from *N. carolinus* and *N. confusus* by the unequal length of the disto-ventral spurs of the hind tibiae. It resembles *N. cubensis* and *N. palustris* in the curvature and shape of the tip of the ovipositor; even the minute truncation of the upper rods is approached in some specimens of these species by the rather sudden curvature of the lower margin of the upper rods close to the apex. It also resembles the last two species in the uniform dark coloration, but differs greatly from them in body size and length of ovipositor. From the subgenus *Allonemobius* the new species differs in the curvature of the ovipositor. It also differs further from *N. maculatus* and *N. ambitiosus* by the uniform body coloration; from *N.*

griseus and *N. griseus funeralis* by the lack of contrasting colors in the tegmina. In size it resembles only *N. fasciatus* and averages larger than the *N. fasciatus socius* which inhabits the same general region. It differs from all races of *N. fasciatus* by (1.) the stouter and more curved ovipositor, (2) the uniform dark color of the tegmina which in *N. fasciatus* generally have distinctly lighter veins or areas, (3) the uniform color of the pronotum, (4) the obliquely sub-truncate apical margin of the dorsal field of the male tegmina, extending but little beyond the lateral field. In dark specimens of *N. fasciatus* the lateral lobes of the pronotum are black above and the ventral margin is pale, even the blackest specimens generally have a pale spot of the ventro-caudal angle. In *N. fasciatus* the apical area of the dorsal field of the male tegmina is rounded and reaches its greatest caudal extension near the middle.

Habitat: The species was found only in the thick growth of marsh grass, *Spartina stricta,* which is one of the dominants in the salt marshes of the North Carolina Coast, forming a zone bordering the brackish sounds. The grass grows about a foot high in a black silty mud which is partly or entirely submerged at high tide. The crickets live about the crowns of the grass and on the ground where they must have to be constantly on the alert to avoid the fiddler crabs which overrun the place.

It was practically impossible to collect the crickets by sweeping in the high grass. The series was obtained by holding the open net on the ground and herding the crickets into it by tramping down the grass.

Song: My attention was first attracted to the species by hearing the unique type of song. Its song is more varied in character than that of any species of the genus I have observed. The usual calling song consists of short notes about one per second at 80°F or about 3 notes per 5 seconds at 70°F. The pauses are of briefer duration than the notes. The sound is high-pitched but rather weak and wheezy for the size of the cricket. Each note increases slightly in volume and pitch after starting. There is no rhythmical regularity about the repetition of notes. Often when starting to sing and at irregular intervals

during the song a longer and louder note, 2 to 3 seconds long may be introduced.

When actively courting the female, the male resorts to short sharp chirps, 3 or 4 per second, but no louder than the longer notes. At times the long and very long notes and the short chirps may be mixed up promiscously in the same song.

The only other cricket song heard in the *Spartina stricta* zone of the salt marshes was the silvery tinkling song of *Anaxipha exigua.*

Additional Data on Nemobius sparsalsus Fulton (Orthoptera: Gryllidae, Nemobiinae).

By MORGAN HEBARD, Philadelphia, Pennsylvania.

Having read the manuscript of Fulton's paper on this interesting species, we made a search for specimens of it in both the studied and unreported series of Gryllidae in the Philadelphia collections.

The results were somewhat surprising, as among the very large series of *Nemobius,* only seven specimens were found, six of these having been recorded as *Nemobius fasciatus socius* (Scudder).

The species closely resembles that insect superficially, but the characters given by Fulton readily distinguish it upon closer examination.

In many very dark individuals of *Nemobius fasciatus fasciatus* (De Geer) and its southern race *fasciatus socius* before us, the pronotum, without exception, has a pale area ventrad on the lateral lobes.

The tegminal truncation in the male sex of *sparsalsus* is valuable in distinguishing it from typical males of *fasciatus,* but in that species a brilliantly colored woodland condition of the central northeastern and southeastern mountainous portion of its range, mentioned by us only in our discussion of color in 1913,[1] also has truncate tegmina in this sex.

[1] Proc. Acad. Nat. Sci. Phila., 1913, p. 410, par. 3 and 4, p. 415, par. 1. That brilliantly colored condition we then believed to represent merely individual color variation, but we now think it probable that a woodland topomorph is represented, possibly worthy of nominal recognition; certainly is as worthy of such as the condition of *palustris* found in the southeast in sphagnum, which we there treated as *Nemobius palustris aurantius* Rehn and Hebard on page 472.

In females of *sparsalsus* the ovipositor curvature is distinct but not decided. The dorsal margin of the dorsal valves at the apex is armed with blunt teeth, quite distinct from the sharp serrations there developed in *fasciatus,* as observed by Fulton.

These notes are based on the following specimens:

Tybee Island, Georgia, September 2, 1911, (Hebard), 1 ♂[2] [Acad. Nat. Sci. Phila.].

Cedar Key, Florida, July 13, 1905, (Rehn and Hebard; on salt marsh tidal flats), 1 ♂, 1 ♀,[3] [Hebard Cln.].

Everglade, Florida, April 9, 1912, (W. T. Davis),[4] 1 ♂, 2 ♀, [Davis and Hebard Clns.].

Virginia Point, Galveston County, Texas, July 21, 1912, (Hebard; one only, under board on salt marsh (*Spartina*).), 1 ♂, [Hebard Cln.].

Measurements (in millimeters).

♂	Length of Body	Length of Pronotum	Length of Tegmen	Length of Caudal Femur	Length of Ovipositor
Tybee Island, Ga.	10.9	2.2	4.7	6.9	
Cedar Key, Fla.	10.7	2.2	4	7.3	
Everglade, Fla.	12	2.7	4.8	8.7	
Virginia Point, Tex.	10.8	2.4	4.8	7.8	—
♀					
Cedar Key, Fla.	9.8	2.6	3.8	7.9	7.8
Everglade, Fla.	11	2.8	4.1	8.7	8.9

We believe that the species is restricted to salt marshes and that it will probably be found quite generally distributed in such environment over its range. The present material shows that its distribution extends south from the type locality, Wilmington, North Carolina, along the Atlantic Coast around Florida to the Gulf Coast and there as far westward as the vicinity of Galveston, Texas. It is quite possible that the type locality represents the northern limit of distribution of *sparsalsus.*

[2] Recorded as *Nemobius fasciatus socius* by Hebard (Proc. Acad. Nat. Sci. Phila., 1913, p. 426) and by Rehn and Hebard (Ibid. 1916, p. 287).

[3] Recorded as *Nemobius socius* by Rehn and Hebard (Proc. Acad. Nat. Sci. Phila., 1907, p. 316) and as *Nemobius fasciatus socius* by Hebard (Ibid., 1913, p. 426).

[4] Recorded, as *Nemobius fasciatus socius* by Rehn and Hebard (Jour. N. Y. Ent. Soc., XXII, p. 114, 1914).

An Experiment in Marking Moths and Finding them Again (Lepid.: Noctuidae).

By AUBURN E. BROWER, Willard, Missouri.

(Continued from page 15).

RESULTS OF THE MARKING WORK.

The list of returns shows that thirty, or 9.55%, of the moths, were found a second time, four of them were found three times, and one of them was found four times. The last, a *C. residua,* was found four times on the same hillside, the last time within a few feet of where it had been marked eight days previously. All of those found three times were *innubens* and *residua.* Two *neogama* were found about one mile (see *map*) from where they were marked. On August 3, two *neogama* were found on the same white oak tree in North Hollow; one had been marked July 27 on a white oak tree 20 feet to the east, and the other had been marked July 29 in Long Hollow about one mile away.

The returns do not indicate any definite movement in one direction but a continuous shifting about; however, the results do not show what became of the numbers of *ilia, neogama,* and *epione* which were found in a hollow one day and which had completely disappeared by the next. The question of what all species do under unusual meteorological conditions is also an open one; nearby local showers greatly reduced returns. Where the moths were, which were marked in a hollow but were not found when that hollow was next worked but were found upon a still later visit, is another puzzle.

The age of the insects has a great influence upon the returns. Worn moths move about much more and presumably much farther than freshly emerged individuals, for most of the worn individuals were never found again. The period of emergence for four species was over, viz., *C. ilia, amica, junctura,* and *epione.* Of these, 159 specimens were marked and only 7, or 4.4%, were found a second time, none a third time. Of the 155 marked specimens of all other species 23, or 14.84%, were found a second time, three of them being found three times, and one more four times. These figures, despite the fact (as

a glance at the Table will show) that the majority of the former were marked during the first days of the work. It was not due to the death of the moths because many of the *ilias* live into September.

C. innubens emerges over a long period, and part were already worn. Of the 25 *innubens* taken, six (including form *scintillans*) were recorded as being distinctly worn, or with damaged wings, and only 1, or 16⅔%, was found again, and only the second time. Of the 19 specimens not recorded as especially worn, 5, or 26.31%, were found again, two of them twice more. *C. lacrymosa, angusi, habalis, vidua,* and *luctuosa* were just beginning to emerge when the marking started, and *robinsoni* had not yet appeared when the work terminated. Species like *innubens* and *residua* — possibly *amica* should be included as all marked individuals were much worn—appear to be more local in their habits than such species as *ilia, neogama, piatrix,* and others.

Quite as significant as the actual returns are the negative data because they are so much greater in quantity. An area would be thoroughly worked and nearly every moth found, captured and marked, but by the next day all, or all but one or two, would have completely disappeared. The morning of July 27, 31 moths were marked in North Hollow; the next morning after another hot, still night, only one, a *nerissa,* could be found. Not one of the nine marked *ilia* could be found, although the adjacent woods were covered in order to see if they had moved away from the hollow. Nevertheless, *ilia* was even commoner in the hollow than the day before, there being more present than could be caught and marked in the time available. July 26, 45 Catocalas were marked in Long Hollow; the next day only one was found. Eighty individuals of *ilia* and its forms were marked, but only two were ever found again.

These data have been presaged by former collecting experiences. *C. ilia* appears early, and after the middle of July perfect specimens are rarely taken, while many species do not reach the height of emergence until later than that date. Big,

blundering ilias always seem to frighten a scarce form away, especially the wary lacrymosas. A number of times in the past, the worn ilias have been netted, and all except the occasional females crushed and tossed aside, but such an attempt to free a favorite collecting hollow was found to be only a temporary relief. More *ilia* replaced those killed just as more *lacrymosa* replaced those taken, and with the former it could not have been a case of emergence. As a rule, a hollow which is closely collected one day is not as good the next as one untouched, but the numbers of Catocalas, many of them flown, which may be found there the next day is proof that the individuals do a great deal of shifting about. In the fore part of the season, *C. junctura* is found in caves and buildings, under ledges, cliffs, and banks, and on trees; but after hot, dry weather commences, the shallow caves in the cliffs are their favorite hiding places. A group of such caves (see *map*) have yielded many specimens in the last fourteen years. In the latter part of the season for the species, almost every visit yields from one to eight specimens, nearly all flown to badly worn; and at that time, except in rainy weather, only rarely can specimens be found under favorable ledges and in old buildings. The country has been searched for miles around without finding a similarly favored spot, so the conclusion that *C. junctura* flies in from unknown distances seems justified.

The results of this work show that Catocalas shift about a great deal, many apparently leaving the vicinity. Some species as *innubens* and *residua* seem to be local in their habits. All species move about much less when freshly emerged than after they become worn. So far as the data show, the movement is in no definite direction. Weather conditions have a great influence upon them. Marking individual moths and finding them again is feasible in some groups with favorable conditions.

An Appreciative Subscriber.

I wish to thank you for inserting my exchange notice; it gave me fine results and if you have space and care to insert it again in the NEWS for the coming year I will surely appreciate it very much.

JOHN IMSCHWEILER, Inglewood, California.

Recognition of Lygus lucorum Meyer from North America (Hemiptera, Miridae).

By HARRY H. KNIGHT, Iowa State College, Ames.

The first record of the occurrence of *Lygus lucorum* Meyer in the Nearctic Region was by P. R. Uhler (1886) in his "Check-List of the Hemiptera Heteroptera of North America". On the authority of Uhler, Mr. Van Duzee (1917) lists *lucorum* Meyer in his *Catalogue,* but no North American specimens have been recognized by any worker since the initial record.

When the writer (1917) published* his revision of the genus *Lygus* for America north of Mexico, no specimens of *Lygus lucorum* Mey. taken in North America could be located. The Uhler collection and other material in the U. S. National Museum was searched with negative results in an effort to find a specimen bearing the label *"Lygus lucorum* Mey." which might have served as the basis for the record by Uhler (1886). In the absence of authentic specimens the writer could not include *lucorum* Mey. among the recognized species of the Nearctic Region.

Recently I received an interesting letter, dated July 11, 1929, from Dr. H. T. Fernald, in which he writes:

> About twelve years ago I turned over our college collection of Hemiptera to Dr. Parshley to name, and I believe that at that time he sent the Mirids on to you. At least many of our Mirids bear the label, "Det. H. H. Knight, 1917." When this material came back I was so rushed with other matters that I had no chance to look it over so it was arranged in the boxes by one of my assistants. Today I happened to pick out one of those boxes and found a specimen labeled as follows: lower label, *'Lygus spinolae* Meyer, Orono,' and with an X, meaning that it was originally named by Uhler; your label, 'Det. H. H. Knight, 1917. This does not occur in U. S. Should not use this record until collecting is authentic'; third label, printed number 519; fourth, the insect mounted on a point.
>
> During the years when I lived at Orono, Maine, I collected Hemiptera quite carefully and kept a record of what I took. These printed numbers I put on to correspond with my entries in a book giving data about the captures, and the numbers were

*Bul. 391, Cornell Univ. Agr. Expt. Sta., 1917.

clipped from what was even then an old copy of the Naturalist's Directory, published in Salem. The type of these numbers was rather distinctive and on looking at the specimen this morning I recognized that number instantly and went to my record book, in which I find the following: "1885. August 25. Got Nos. 509-326 in the pasture back of the college..... 519. Green Lygus lineolaris?"

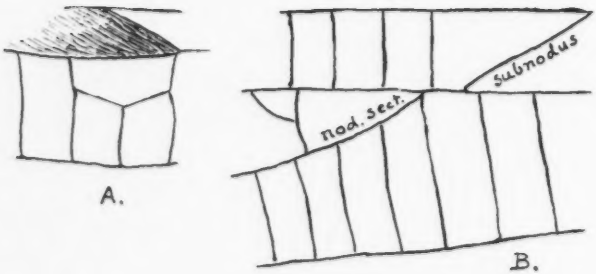
That insect was either later sent to Uhler and named, or was named by him at the time I was living with him in Baltimore in 1886.

I then wrote Dr. Fernald stating that I remembered the specimen quite well, but recalled that I thought it might represent *Lygus lucorum* Mey. instead of *L. spinolae* Mey. Not wishing to trust my memory for so long a period in a matter involving the record of an European species occurring in North America, I requested Dr. Fernald to again send the specimen for examination. Dr. Fernald very kindly complied with my request so I have been able to compare his specimen with European specimens of *L. lucorum* Mey. and *L. spinolae* Mey. The result is I find the Orono specimen to be *Lygus lucorum* Meyer.

The species, *Lygus lucorum* Mey. and *Lygus spinolae* Mey., are closely allied green forms, yet may easily be separated by certain color characters that have been used by the best European authors without objection. In *lucorum* Mey. the cuneus is entirely green, whereas, in *spinolae* Mey. the cuneus is black at the extreme apex. There are also other characters but the color of the cuneus may be relied upon to separate the species.

The fact now seems well established, namely, that Dr. H. T. Fernald collected *Lygus lucorum* Mey. at Orono, Maine, Aug. 25, 1885. Dr. Uhler examined this specimen shortly after and gave Dr. Fernald the name *Lygus spinolae*. However, Uhler records *Lygus lucorum* Mey. in his Check List of 1886 and fails to mention *spinolae* Mey. I have asked Dr. Fernald his opinion of how the label *spinolae* Mey. can be explained for his specimen. He writes as follows:

> It is my opinion now that Uhler named this specimen *Lygus spinolae* and that later, in preparing his Check List, either forgot all about it but had evidence from other sources of the presence of *lucorum* in this country, or else that, on thinking the matter over, he decided that this specimen was, after all,



PROTOTHORE EXPLICATA—COCKERELL

lucorum. I am positive that he gave me the name *spinolae* for it, or I would not have known anything about *spinolae.*

The writer hopes this article may stimulate some interest among the entomology students at Orono, and send them forth to search for the long lost *Lygus lucorum* Mey. It is possible that some of the collections made in that locality may even now contain this uniformly green *Lygus.* However, there is another green species, *Lygus pabulinus* L., which occurs in that area and may cause confusion in identification, but *pabulinus* L. is more slender and distinguished by having the carina across base of vertex obsolete on the middle. *Lygus lucorum* Mey. is about the size and shape of the tarnished plant bug (*L. pratensis oblineatus* Say), but uniformly green or yellowish green in color. By next summer it will be forty-five years since Dr. Fernald captured the only known specimen of *Lygus lucorum* Mey. from North America. Who will be the first to rediscover this long neglected species?

A Fossil Dragon-fly from California (Odonata: Calopterygidae).

By T. D. A. COCKERELL, Boulder, Colorado.

(Plate VI.)

It has seemed strange that the State of California, so rich in fossils of many kinds, possessed no deposits of fossil insects, with the exception of certain beetle elytra from the Pleistocene. Recently, however, Dr. Ralph W. Chaney was looking for fossil plants in the Eocene of Northern California, and at Phillips sawmill, five miles southeast of Montgomery Creek, Shasta County, he found the central portion of a dragon-fly wing in soft bluish rock. It occurred with fossil plants indicating a swamp habitat. The specimen, though imperfect, seems unquestionably to belong to the Zygopterous subfamily Polythorinae, at present confined to the Neotropical Region. I am inclined to interpret this as meaning that the Polythorinae originated in the north, not as representing an immigrant from some southern region.

At first, I was disposed to place the insect in the genus *Euthore,* but it combines characters of *Euthore* and *Chalcopteryx,* and considering its antiquity and location, there can be

little doubt that it represents a distinct genus, the distinctness of which would be more evident if we possessed the whole wing.

PROTOTHORE new genus.

Rather small species, the wings conspicuously marked, black and hyaline; (*a.*) stigma (pterostigma) large but slender, not as deep as the substigmatal cells; (*b.*) base of stigma with a transverse cell below, composed of upper part of the first two substigmatic cells; (*c.*) postnodal cells numerous, about 43, of which 20 are before the median black area; the first 20 or more are much higher than long, some twice as high as long; (*d.*) cells beyond subnodus (23 before median black area) practically as in *Euthore,* but the cross-veins of cells in light area are not in a straight line with those above (*Chalcopteryx* character); (*e.*) subnodus ending some distance (about a cell's width) before origin of nodal sector (R_3 of Tillyard, M_2 of Needham); (*f.*) eight cells before doubling begins above nodal sector, but second cell with a triangular division above, doubtless a variable character.

Character *f.* agrees with *Euthore,* not at all with *Chalcopteryx.* Character *c.* agrees with *Chalcopteryx.* Character *e.* agrees with *Libellago.* Character *a.* is different from *Chalcopteryx* and *Euthore.* Character *b.* is probably not constant; a similar transverse cell may sometimes be seen in *Epiophlebia,* beyond the region of the stigma.

Protothore explicata new species.

Wing hyaline in middle, from about two or three cells beyond subnodus for a distance of about 7 mm., the end of the clear area curved apicad; rest of wing, so far as can be seen, black; the black extending as far as the stigma and probably to the apex; shape of wing, so far as can be seen, about as in *Euthore.* Nodus to base of stigma 14.5 mm.; length of stigma about 3 mm.; width (depth) of wing in region of subnodus about 9 mm., in region of stigma apparently 7.2 mm., but there is some disarrangement and overlapping, so the actual depth is doubtless greater.

I am indebted to my colleague Mr. Paul Shope for the photograph of the wing. The specimen belongs to the University of California.

Another Genus of Protura in California.

By. W. A. HILTON, Department of Zoology, Pomona College, Claremont, California.

For a number of years we have been attempting to determine the distribution of insects and other arthropods in southern California. It was not until the spring of 1928 that Miss Edith Clayton, a student in the department, in connection with an investigation of soil insects, discovered a few specimens of this group in with a great host of Collembola and mites. She used a Berlese funnel and searched especially among the dead leaves at the bases of live oaks. Previous to this there have been a number of records within the limits of the United States. I have looked for them in a number of western states, and also in Cuba and Mexico, but without success. This failure to find them in regions where they might well be expected was due in part to the fact that I did not at first use the funnel method for collecting.

Ewing has described one new species, *Eosentomon yosemitensis,* from the Yosemite Valley and recorded the occurrence of another, *Acerentomon microrhinus* Berlese, from the same place. Our specimens do not correspond to either of these, in fact they belong to Berlese's genus *Acerentulus.* This makes a new record for the genus and adds one to the number of species known to occur here. Berlese mentions ten species from Italy and, as conditions in southern California are somewhat similar, we may reasonably hope for many more records from California.

A member of this genus described by Ewing from Takoma Park, Maryland, under the name of *Acerentulus barberi* differs markedly from ours. The most striking contrast between the two species is in the second and third abdominal segments, which in ours are not cone-shaped. The prothoracic legs are also proportionately shorter in these California specimens and the proportions of the body parts also differ. Berlese's species *Acerentulus perpusillus* resembles ours much more closely. The general shape of the body, the position of the pseudoculi and the general proportions of the legs and body parts are similar. His specimens were .6 mm. in length and our largest

were 1.2 mm. The distribution of the dorsal setae differs quite decidedly. Unfortunately Berlese's description does not give anything about the abdominal appendages and these seem to be quite important. Whatever species this California form may prove to be, at least it is clearly of the genus *Acerentulus*.

With such minute forms it would seem that specific descriptions should be quite detailed. Berlese's characterizations in some cases are very scant. The only virtue that saves some of them from being worthless is the series of very excellent drawings, but even here a few more might have helped to distinguish his species from others not known to him. The characters which must be used are many of them minute and for that reason careful drawings showing the positions of the setae and proportions of parts are very helpful. Proportions alone are good, but if the total length is given, measurements of other parts might more accurately indicate conditions.

It is our hope to extend the range of known forms in this group as soon as possible. However, it is not easy to find these specimens. If dead leaves or other materials containing them are too dry or too wet it is almost impossible to discover them. They are seldom abundant; we have usually found but one or two at a time. Those near Claremont were of various sizes but all seemed of the same species. Some were found at the edge of the mountains, others, apparently exactly like them, were discovered in the college park among the live oaks.

Possible Light on Geographic Distribution of Insects.

Entomologists interested in the fauna of the West Indies should not overlook a paper which appeared nearly a year ago but whose title and place of publication, although perfectly appropriate, would not find mention in strictly entomological literature. Reference is made to Prof. Charles Schuchert's "Geological History of the Antillean Region" (Bull. Geol. Soc. Amer., 40: 337-360, with 9 paleogeographic maps. Published March 30, 1929). The maps show the presumed distribution of land and water in southern North America, northern South America and the West Indies, in upper Carboniferous and lower Permian, Jurassic, Cretaceous, Eocene, Oligocene, Miocene and Pliocene times, and illustrate such questions as the existence and non-existence of land connections of these continents and islands.

New Species of Dolichopodidae from North America (Diptera).

By MILLARD C. VAN DUZEE, 12 Abbotsford Place, Buffalo, New York.

Rhaphium latifacies new species.

♂ : Length 4 mm. Face wide, silvery white, rounded below, its sides nearly parallel; proboscis and palpi black with black hairs and bristles; front covered with white pollen; antennae black, third joint half as long as the face, arista two-and-one-half times as long as third joint; beard white, moderately abundant.

Dorsum of thorax green, dulled with white pollen; pleurae blackish with white pollen; scutellum with two pair of marginal bristles. Abdomen blue-green with black hair and considerable white pollen, hairs on the venter whitish; hypopygium black, rounded above, conspicuous, its lamellae black, elongate triangular, one-third as long as height of hypopygium, inner appendages small, mostly concealed.

Fore coxae, all femora and tibiae yellow; apical third of hind femora and extreme tip of posterior tibiae black; fore coxae with black hair and bristles, both hair and bristles appear yellow in certain lights; middle coxae without a thorn at tip; all femora with pale hairs below, but these also appear black in certain lights and are not as long as width of femora; fore femora with long pale hairs on posterior surface; fore and middle tarsi from the tip of the first joint and whole of hind tarsi black; all tarsi plain; joints of fore tarsi as 41-14-13-10-10; of middle ones as 54-18-15-8-7; joints of hind pair as 41-27-20-10-9. Calypters, their cilia and the halteres yellow.

Wings grayish, darker in front of fourth vein; third vein bent backward towards the tip; last section of fourth vein quite sharply bent before its middle, parallel with third for a short distance at tip, ending just back of the apex of the wing; last section of fifth vein straight, twice as long as the crossvein.

Described from one male, taken by Owen Bryant, July 10, 1925, at Lake Agnes, Laggan, Alberta, at an elevation of 6,800 feet. *Type* in the U. S. National Museum. No. 20578.

Rhaphium longibara new species.

♂ : length 4 mm. Face narrow, silvery white; palpi and proboscis black; front shining green; antennae black, third joint four-fifths, arista six-sevenths, as long as the face; beard white, abundant but not very long.

Thorax green with a little white pollen on front of dorsum and on pleurae; scutellum with one pair of bristles. Abdomen shining green, its hair black on dorsum, white on venter, third, fourth and fifth segments coppery at base; hypopygium black, rather small, flattened posteriorly, its lamellae filiform, broader at base, brown, fringed with long pale hairs, the lamellae as long as middle tibiae; inner appendages black, slender with a conspicuous lobe on one side near the tip, a little less than two-fifths as long as height of hypopygium.

All coxae, fore and middle femora and apical two-thirds of hind femora green; tips of fore and middle femora, basal third of hind ones and fore and middle tibiae and basitarsi yellow; hind tibiae mostly black, yellowish above on basal third; fore and middle tarsi from tip of second joint and whole of hind tarsi black, fore coxae with abundant, long, white hair; middle coxae with a black thorn at tip; middle femora with short white hair below; fore tibiae with two rows of long, bristly, black hairs on upper surface, these are as long as width of femora; middle basitarsus with three long bristles below near the base, the longest being three times as long as diameter of the joint; first joint of fore tarsi concave below, being narrowed in the middle, larger at each end and with a row of spine-like, short hairs below, which are about as long as diameter of joint; second joint a little widened in the middle below, the lower edge being slightly and evenly rounded, it has a row of delicate hairs below, which are a little shorter than width of joint in the middle, joints of fore tarsi as 33-25-8-6-8; of middle ones as 43-23-15-8-8; joints of hind ones as 35-29-21-17-11; Calypters and halteres yellow, the former with white cilia.

Wings grayish; third vein bent backward towards the tip; last section of fourth vein without a distinct bend, but arched so as to be parallel with third at tip, ending in the apex of the wing; last section of fifth vein straight, scarcely reaching the wing margin, it is 38, crossvein 20-fiftieths of a millimeter long.

♀ : One female taken two days later at the same place, is no doubt the same species; having the venation of the wings the same; the color of the legs about the same and the fore coxae with long white hair.

Its face broad, silvery white; third antennal joint one-third, arista one and a fourth times as long as the face; fore tibiae with one row of bristly hairs above on anterior edge; middle femora at extreme base, basal half of hind femora and basal three-fourths of hind tibiae yellow; fore and middle tarsi plain.

Described from one pair, taken at Banff, Alberta; *type*, male, on June 29, *allotype*, female, July 4, 1925, by Owen Bryant. The allotype was taken on Norquay Mt., at an elevation of 5,000-6,000 feet. Type in U. S. N. M., No. 20579.

Neurigona ornatus new species.

♂ : Length 4.5 mm. Face linear, silvery white; front and occiput black wtih white pollen; antennae yellow, small; orbital cilia whitish yellow. Thorax black; prothorax, humeri, posterior edge of pleurae, outer margin of scutellum, root of wings and some of the sutures of the thorax yellow; dorsum of thorax dulled with gray pollen, especially the depressed space before the scutellum. Abdomen yellow with large shining black patches on the upper surface, that on second segment covering all the dorsum, except the posterior margin, on the following segments the black is more narrowed posteriorly. Hypopygium black, the basal part appearing more like an apical segment of the abdomen, outer part somewhat square in outline and with small, indistinct, yellowish appendages at tip.

Coxae, femora and tibiae yellow; fore tarsi with first three joints yellow, last two black, flattened, fourth nearly round when seen from above, fifth oval, longer than wide, cut off nearly straight at tip, one claw long and enlarged: all joints with long hairs above, which are about twice as long as the diameter of the joint, those on first joint a little shorter; middle and hind tarsi blackened from the tip of first joint; first four joints of middle tarsi with a row of stiff black hairs below, these are a little longer than the diameter of the joints; joints of fore tarsi as 103-64-28-8-12; width of last joint at tip as 10 and length of long claw the same; joints of middle tarsi as 137-48-30-19-12; of hind ones as 67-68-36-22-12. Calypters, their cilia and the halteres yellow.

Wings gray, veins brown almost to the root of the wing; last section of fourth vein bent near its middle, ending rather close to tip of third and considerably before the apex of the wing, third and fourth veins bent backward at tip; last section of fifth vein about three times as long as the crossvein; sixth vein strong and reaching the wing margin; anal angle of wing prominent.

Described from one male, taken by Owen Bryant, June 5, 1925, at Edmonton, Alberta, Canada. *Type* in the U. S. National Museum. No. 20580.

This is separated from all related species by the form of the anterior tarsi and their enlarged claw.

(To be continued)

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1930.

Entomology at the Convocation Week Meetings, December 27, 1929, to January 2, 1930.

Following is our annual summary of the programs of the eighty-sixth meeting of the American Association for the Advancement of Science, and of the associated societies held at Des Moines, Iowa, in so far as entomology is concerned.

The numbers of papers listed by the various societies were as follows:

Entomological Society of America	38
American Association of Economic Entomologists	83
American Society of Zoologists	12
Same, Joint Genetics Section	10
Ecological Society of America	1
American Meteorological Society	1
Section C (Chemistry), A. A. A. S.	1
Wilson Ornithological Club	1
American Phytopathological Society	6
American Society of Horticultural Science	1
Total	154

These papers were distributed in subject as follows:

General Entomology	5	Affecting Man or other Animals	1
History of Entomology	2	Taxonomy	4
Teaching Entomology	2	General Economic Entomology	16
Collecting Methods	1	Insecticides and Appliances	14
Cytology	3	Apiculture	9
Anatomy	5	Affecting Cereals, Forage and Field Crops	14
Physiology	24	Do., Truck Crops	9
Ecology	11	Do., Greenhouse Plants	1
Geographical Distribution.	1		
Ontogeny	12		
Genetics	11		
Parasites of Insects	7		

Do., Fruits and Fruit Trees	21	Coleoptera (excluding the Japanese beetle)	13
Do., Household and Stored Products	7	Japanese beetle	5
Do., Forest and Shade Trees	6	Hymenoptera (excluding *Apis*)	10
Carrying Plant Disease Germs	5	*Apis*	9
ii		Lepidoptera (excluding Codling Moth, Oriental peach Moth, Corn-borers)	11
Orthoptera	9	Codling Moth	6
Psocoptera	1	Oriental Peach Moth	6
Odonata	1	Corn Borers	3
Ephemerida	1	Diptera (excluding *Drosophila*)	11
Homoptera	15	*Drosophila*	3
Heteroptera	2		
Thysanoptera	1		

Many of these figures are duplications, both between sections i and ii and also within each section.

The total of 154 is lower than that of any of the preceding six years, the loss being due to the much lower figure accredited to the Association of Economic Entomologists. Since the Northeastern branch of this Association held a meeting at New York, as recently as last November, at which many papers were presented, the decrease can probably be accounted for in this way. Papers on Physiology continue to hold a prominent place.

The Entomological Society of America, Prof. C. T. Brues, *president,* Prof. J. J. Davis, *secretary,* met December 28 to 30. The annual public address, "Economic Adventures of an Uneconomic Entomologist," was given by Dr. Wm. M. Mann, Director of the Zoological Park, Washington, D. C., on the evening of December 30. He dealt with some of his experiences in Mexico on the trail of insect pests that are likely to be shipped into the United States, especially the orange maggot (*A. ludens*), illustrated with lantern slides of scenes in Mexico.

The American Association of Economic Entomologists, Prof. T. J. Headlee, *president,* Mr. C. W. Collins, *secretary,* met December 29 to January 2. The annual address of the Presi-

dent, "Some Tendencies in Modern Economic Entomological Research," was delivered on December 31.

Both societies were invited by Iowa State College to visit the campus and laboratories of zoology and entomology at Ames, on Sunday, December 29, where dinner was served to 212 persons at the Memorial Union at 1 P. M. Following this Dean Beyer of the Science Division of the College gave a brief welcome to all the visitors. Dr. Herbert Osborn gave an informal address on the early history of entomology in the central states and called on Dr. C. P. Gillette to recount his personal experiences with Prof. Cook. Dr. S. A. Forbes, although expected to take part, was not present. Dr. H. H. Knight, to whom the NEWS is indebted for some of this information, writes that the trip to Ames was a great success according to all the comment he has heard.

The annual entomologists' dinner was held in the Hotel Savery, at Des Moines, on Tuesday evening, December 31.

Entomological Literature

COMPILED BY FRANK HAIMBACH AND LAURA S. MACKEY
UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☛ *Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

GENERAL.—Bandermann, F.—Botanisches und Entomologisches. [18] 23: 380-382. **Chittenden, F. H.**—Obituary. By L. O. Howard. [12] 22: 989-990, ill. **Dingler & Henneberg.**—Apionlarven in "springenden Kapseln". [Mitt.

Münch. Ent. Gesell.] 19: 165-171, ill. **Friedrich, A.**—Erlebnisse in Bahia (Brasilien) um der Entomologie willen! [Ent. Jahrbuch] 1930: 91-98. **Lewis, H. C.**—A method of preparing insect mounts. [12] 22: 980-984, ill. **Martell, P.**—Die beine im altertum. [26] 9: 414-419. **McColloch, J. W.**—Obituary. By G. A. Dean. [12] 22: 990-991. **Plank, H. K.**—Natural enemies of the sugar cane moth stalkborer in Cuba. [7] 22: 621-640, ill. **Reed, M. M.**—Citrus insects of northeastern Argentina. [39] 13: 67-68. **Stäger, R.**—Warum werden gewisse insekten von den ameisen nicht verzehrt? [45] 24: 227-230. **Taylor, R. L.**—The biology of the white pine weevil, Pissodes strobi (Peck), and a study of its insect parasites from an economic viewpoint. [70] 9: 167-205. **Vogt, A.**—"Aus der praxis des schmetterlingssamlers." [18] 23: 393-395. **Warnecke, G.**—Die benennungssucht in der Entomologie. [Ent. Jahrbuch] 1930: 53-58. **Couper, William.**—A pioneer Canadian Naturalist. By J. L. Baillie, Jr. [Canadian Field Nat.] 43: 169-176, ill. **Wright, F. R. E.**—The attractive force in assembling insects. [8] 65: 265-266. **X. Y. Z.**—Tagebuchblätter aus dem Urwalde. (S). [Ent. Jahrbuch] 1930: 132-136, ill.

ANATOMY, PHYSIOLOGY, ETC.—Banta, A. M.—The elimination of the male sex in the evolution of some lower animals. [76] 1930: 59-65, ill. **Barnes, H. F.**—Unisexual families in Rhabdophaga heterobia (Cecidomyidae). [8] 65: 256-257. **Brown & Hatch.**—Orientation and "Fright" reactions of whirligig beetles (Gyrinidae). [Jour. Comp. Phych.] 9: 159-189, ill. **Bugnion, E.**—Les organes bucco-pharyngés de deux Sphégiens: Sceliphron (Chalybion) bengalense et Sceliphron (Pelopoeus) spirifex. [41] 14: 139-170, ill. **Champy, C.**—La croissance dysharmonique des caractères sexuels accessoires, son importance biologique. Applications pratiques de ses lois. [An. Sci. Nat. Zool. Paris] 12: 193-244, ill. **da Costa Lima, A.**—Considerações sobre a musculatura dos segmentos terminaes da perna de alguns insectos e sobre a funcção do chamado Orgão Tarsal. [Suppl. Mem. Inst. Oswaldo Cruz, Rio de Janeiro] 1929: 257-264, ill. **Dunavan, D.**—A study of respiration and respiratory organs of the rat-tailed maggot, Eristalis arbustorum. [7] 22: 731-753, ill. **Payne, N. M.**—Absolute humidity as a factor in insect cold hardiness with a note on the effect of nutrition on cold hardiness. [7] 22: 601-620, ill. **Shull, A. F.**—The effect of intensity and duration

of light and of duration of darkness, partly modified by temperature, upon wing-production in aphids. [W. Roux' Arch. Entw. Organ.] 115: 825-851, ill. **Shute, P. G.**—The effect of severe frost on larvae of Culicella morsitans (Culicidae). [9] 62: 243-244.

ARACHNIDA AND MYRIOPODA.—*Ewing, H. E.—A synopsis of the American Arachnids of the primitive order Ricinulei. [7] 22: 583-600, ill. **Jacot, A. P.**—Genera of Pterogasterine Oribatidae (Acarina). [Trans. American Micro. Soc.] 48: 416-430. **Thor, S.**—Ueber die phylogenie und systematik der Acarina, mit beiträgen zur ersten entwicklungsgeschichte einzelnen gruppen. [Nyt. Mag. Nat., Oslo] 67: 145-210, ill.

THE SMALLER ORDERS OF INSECTS.—Klein, B. M.— Libellenhochzeit. [Der Naturf., Berlin] 6: 329-335. **Krull, W. H.**—The rearing of dragonflies from eggs. [7] 22: 651-658. **Light, S. F.**—New termite records for lower California. [55] 6: 67-72. ***Malcomson, R. O.**—Two new species of Mallophaga. [7] 22: 728-730, ill. **Moulton, D.**—New Thysanoptera from Cuba. [39] 13: 61-66. **Ris, F.**—Gynandromorphismus bei Odonaten. [41] 14: 97-102, ill. **Shepherd, D.**—Ephemerella hecuba; description of various stages. (Ephemerida, Baetidae). [4] 61: 260-264, ill.

ORTHOPTERA.—*Hebard, M.—Previously unreported tropical american Blattidae in the British Museum. [1] 55: 345-388, ill. ***Hebard, M.**—Supplementary notes on Panamanian Dermaptera and Orthoptera. [1] 55: 389-399, ill. **Imms, A. D.**—The locust problem. [31] 124: 950-952, ill. ***Uvarov, B. P.**—Marellia remipes, gen. et sp. n. (Acrididae), a new semiaquatic grasshopper from S. America. [75] 4: 539-542, ill.

HEMIPTERA.—Hungerford, H. B.—Concerning two of Guérin-Meneville's types in the National Museum of Paris (Notonectidae and Corixidae). [55] 6: 73-77, ill. ***Lobdell, G. H.**—Two new species of Eriococcus from Mississippi (Coccoidea). [7] 22: 762-767. ***Parshley, H. M.**—New species and new records of Aradus (Aradidae). [4] 61: 243-246, ill. **Shull, A. F.**—Determinations of types of individuals in aphids, rotifers and cladocera. [Biol. Reviews] 218-248. ***VanDuzee, E. P.**—A new Oliarus. [55] 6: 72. ***Walley, G. S.**—Notes on Homaemus with a key to the species (Scutelleridae). [4] 61: 253-256, ill.

LEPIDOPTERA.—*Bouvier, E. L.—Additions à nos connaissances sur les Saturnioïdes américains. [An. Sci. Nat. Zool. Paris] 12: 245-343, ill. **Gaede, M.**—Ueber den wert von bestimmungstabellen für schmetterlinge. [18] 23: 377-380. **Gunder, J. D.**—A state butterfly for California. [55] 6: 88-90, ill. **Hering, M.**—Synopsis der Blattminen an Ulmus. [Ent. Jahrbuch] 1930: 59-70, ill. **Hoffmann, F.**—Ueber die Lepidopteren-fauna Brasiliens im allgemeinen und der von Südbrasilien im besondern. [Ent. Jahrbuch] 1930: 123-131. **Hoffman, F.**—Der Psychidenbaum in Sáo Francisco do sul und anderes. (S). [14] 43: 199-200. **Hulstaert, P. G.**—Genera Insectorum. Fasc. 191. Fam. Anthelidae. 13pp., ill. **Pickens, A. L.**—The "Coffee-Pot" cocoon and the insect that makes it. [55] 6: 63-66, ill. **Sjöstedt, Y.**—Ueber einen . . . zwitter von Morpho rhetenor, den prachtvollsten aller bisher bekannten gynandromorphen Lepidopteren, nebst Literatur über die zwitter (Hermaphroditen) dieser insektengruppe. [83] 20: 1-60, ill. **Skinner, H. M.**—The giant moth borer of sugar-cane. (Castnia licus). (S). [Suppl. "Tropical Agric. Trinidad] 1929: 8pp., ill. **Snapp & Swingle.**—Life history of the oriental peach moth in Georgia. [U. S. Dept. Agric. Tech. Bull.] 152: 16pp., ill. **Sokolov, G. N.**—Die struktur des männlichen kopulationsapparates bei der gattung Parnassius. [Rev. Russe Ent.] 23: 60-71, ill.

DIPTERA.—*Aldrich, J. M.—New genera and species of muscoid flies. [50] 76, Art. 15: 13pp. ***Aldrich, J. M.**—Revision of the two-winged flies of the genus Coelopa in North America. [50] 76, Art. 11: 6pp. ***Alexander, C. P.**—New species of crane flies from South America. Part III. (Tipulidae). [7] 22: 768-788. ***Alexander, C. P.**—A list of the crane-flies of Quebec I. [4] 61: 247-251. **Allen, H. W.**—An annotated list of the Tachinidae of Mississippi. [7] 22: 676-690, ill. ***Cresson, E. T., Jr.**—A revision of the North American species of fruit flies of the genus Rhagoletis. (Trypetidae). [1] 55: 401-414, ill. **Edwards & Keilin.**—Genera Insectorum. Fasc. 190. Fam. Protorhyphidae, Anisopodidae, Pachyneuridae, Trichoceridae. 41pp., ill. **Enderlein, G.**—Klassifikation der Sarcophagiden. Sarcophagiden-Studien I. [Arch. Klass. & Phylogenet. Ent.] 1: 56pp., ill. ***Enderlein, G.**—Zur kenntnis einiger von Herrn Oskar Schoenemann gesammelten chilenischen Melpiinen. [48] 46: 66-71. ***Reinhard, H. J.**—Notes on the muscoid flies of the genera Opelousia and Opsodexia with the description of three new species. [50] 76, Art. 20: 9pp.

COLEOPTERA. — ***Blaisdell, F. E.** — Miscellaneous studies in the Coleoptera, III. [55] 6: 57-62, ill. **Cros, Dr.**—Observations nouvelles sur les Méloés. [An. Sci. Nat. Zool. Paris] 12: 137-168. ill. **de Lapouge, G. V.**—Genera Insectorum. Fasc. 192. Fam. Carabidae; Subfam. Carabinae. 153pp., ill. ***Eggers, H.**—Zehn neue Loganius-arten (Ipidae) aus Südamerika. [48] 46: 59-65. **Eggers, H.**—Zur synonymie der Borkenkäfer (Ipidae). [48] 46: 41-55. **Fletcher, F. C.**—Notes on a few Minnesota Coleoptera. [4] 61: 256-260. **Friedrich, A.** — Die fauna der cacaoplantage. [14] 43: 206-210, ill. **Frost, C. A.**—Lema palustris [at Framingham, Mass.] [5] 36: 215. **Hetschko, A.**—Zur nomenklatur einiger Clavicornierarten. [48] 46: 94. ***Hopping & Hopping.**—II. New Coleoptera from Western Canada. [4] 61: 251-253, ill. **Laboissière, V.**—Sur la sous-famille des Chlamydinae (Chrysomelidae). [25] 1929: 256-258. ***Ochs, G.**—Notes upon some Gyrinidae in the Carnegie Museum with descriptions of new species. [3] 19: 123-134. **Reineck, G.**—Beitrag zur lebens-und entwicklungsweise von Coleopteren. [45] 24: 220-226, ill. **Schenkling, S.**—Welcher Rüsselkafergattung kommt der name Curculio zu? [48] 46: 79-81. **Tanner, V. M.**—The Coleoptera of Utah—Cicindelidae. [55] 6: 78-87. ***Wasmann, E.**—Ein neuer Xenocephalus aus Costarica. [48] 46: 81-82, ill. **West, L. S.**—A preliminary study of larval structure in the Dryopidae. [7] 22: 691-727, ill. ***Williams, S. H.**—A list of prionid beetles taken at Kartabo, Bartica district, British Guiana, with the description of a new species. [3] 19: 139-148, ill.

HYMENOPTERA.—***Bequaert, J.**—The folded-winged wasps of the Bermudas, with some preliminary remarks on insular wasp faunae. [7] 22: 555-582. ***Cockerell, T. D. A.**—Some bees of the group Trachandrena, (Andrenidae). [7] 22: 754-758. **Kuznetzov-Ugamskij, N. N.**—Neue angaben über den hochzeitsflug der ameisen. [Rev. Russe Ent.] 23: 101-106. **Neumann, C. W.**—Wie der bienenstaat sich entwickelte [Ent. Jahrbuch] 1930: 158-170. **Rau, P.**—The nesting habits of the bald-faced hornet, Vespa maculata. [7] 22: 659-675, ill. ***Santschi, F.**—Melange myrmecologique. (S). [48] 46: 84-93, ill. **Schmiedeknecht, O.**—Opuscula Ichneumonologica. Genus Ichneumon. Suppl. Bd: 353-432. ***Turner, R. E.**—Notes on Chilean Thynnidae. [48] 46: 56-58.

OBITUARY.

Among the entomologists whose deaths occurred during 1929, and whose passing has not hitherto been mentioned in the NEWS, was the Reverend ALFRED EDWIN EATON, monographer of the may-flies. He died at Northam, North Devon, March 23, 1929, and at that time was the senior Fellow of the Entomological Society of London, to which he was elected July 3, 1865. An obituary notice appeared in the *Entomologists' Monthly Magazine* (London) for May, 1929. In 1873 he accompanied B. Leigh Smith on a cruise to Spitzbergen. In 1874 he was naturalist to the British Transit of Venus Expedition to Kerguelen Land where he made extensive collections of plants and animals which he described and discussed in the *Philosophical Transactions* (vol. 168, 1879). His *Revisional Monograph of Recent Ephemeridae* of 352 pages, appeared in the Linnean Society's *Transactions* (Zoology) between 1883 and 1887 and is well-known as the most authoritative treatise on this group of insects for many years. The types of the species described passed into the collection of the late Robert McLachlan, of Lewisham, London, who showed them to the writer in 1895. Supposedly they remain in Mr. Hugh McLachlan's possession. Among Eaton's other works on the may-flies were the 16 pages which he contributed to the Neuroptera volume of the *Biologia Centrali-Americana* (1892) and a brief one, his last on this group apparently, on those of the Seychelles (1913). He was also interested in the Psychodidae and published on the British members of this family (Ent. Mo. Mag. 1893-1898). *Science* for December 13, 1929, quoting from the London *Times*, states that his widow has presented his collection thereof, of over 1800 pinned specimens and about 200 microscopic slides, to the department of entomology of the British Museum. Besides the known British species, it includes much material from Switzerland, Algeria, Madeira, the Canary Islands and elsewhere. Mr. Eaton "had also accumulated extensive notes in preparation for a monograph on the group, and it is hoped that it may be possible to publish some parts of his manuscript."

FRANK HURLBUT CHITTENDEN, born in Cleveland, Ohio, November 3, 1858, died at Washington, September 15, 1929. He graduated from Cornell University in 1881 and was given the honorary degree of D.Sc. by the University of Pittsburgh in 1904. He entered the service of the Federal Department of Agriculture in April, 1891, and there remained until his death, becoming chief of the section on truck crops and insects affecting stored products. Dr. L. O. Howard, who contributes an obituary notice of him, accompanied by a portrait, to the *Journal of Economic Entomology,* for December last, writes: "Those of us who knew him best here in Washington, and who worked with him for very many years, think that he was probably the most learned man in America on everything relating to the insects that are found in the garden." In addition to the insects with which his section was particularly concerned, Dr. Chittenden especially studied the Coleoptera. Leng's *Catalogue* of the Coleoptera of America North of Mexico and the *Supplement* thereto cite 22 of his papers on this order, those purely economic being omitted. Lists of 140 of his writings, 1888-1904, on economic insects will be found in parts vi-viii of the *Bibliography of the most important contributions to American Economic Entomology* by Nathan Banks.

JAMES WALKER MCCOLLOCH, Professor of Entomology at the Kansas State Agricultural College since 1925, died at Manhattan, Kansas, November 11, 1929. He had received the B.Sc. of the same College in 1912 and was made Associate Professor in 1918. In addition, he was Assistant Entomologist (1912-18) and Associate Entomologist (1918 on) at the Kansas Agricultural Experiment Station. His chief work was on the chinch bug and the Hessian fly. Prof. G. A. Dean, in an obituary notice in the *Journal of Economic Entomology* for December, 1929, pays high tribute to the thoroughness of his investigations and his devotion to his duties. He was born at Anthony, Kansas, April 14, 1889.

Science for October 4, 1929, announced that "Dr. GEORGE F. GAUMER, of Izamel, Yucatan, discoverer of several new mammals and author of a monograph of the mammals of Yucatan, died on September 2." He collected insects also, some of which are quoted in the *Biologia Centrali-Americana.*

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—Blues, Coppers, Hairstreaks of all States, also Euchloe genutia. Norman R. Gunn, 1951 Yosemite Road, Berkeley, Calif.

Wanted—Specimens of Psammocharidae, particularly of the subfamily Pepsinae, from North America, Central America and West Indies. Will buy or borrow material for study.—K. A. Salman, Fernald Hall, Amherst, Mass.

Exchange—Pselaphidae and Scydmaenidae from all regions of earth, especially tropics, wanted for cash, exchange, or det: will give collectors going to tropics instructions for collecting them. F. C. Fletcher, 1766 James Ave. So., Minneapolis, Minn., U. S. A.

Exchange—South American, also Jave, Borneo, Celebes Butterflies in lots by 12, 50 or 100 monthly arrivals. Wish for revisional study all North American PARNASSIUS and ARCTIDAE, also APPATENSIS. Communicate with Mrs. Emma Kessler, 499 Manhattan Ave., New York City.

Wanted—Everes comyntas and amyntula from all parts of N. Am. by purchase or exchange for local lepid. Dr. Edwin P. Meiners, 6600 Delmar Blvd., St. Louis, Mo.

Wanted for Exchange or Determination, specimens of the genus **Eucerceris** of the Hymenoptera, tribe of Cercerini. H. A. Scullen, Department of Entomology, Oregon State Agricultural College, Corvallis, Oregon.

Mordellidae of the world wanted in exchange for North American species. Address Dr. F. J. Psota, 2434 South Crawford Avenue, Chicago, Illinois.

Oxybelinae (Sphecidae, Hymenoptera)—Wanted from all parts of North and South America and West Indies. Will determine, exchange or purchase. V. S. L. Pate, Entomology Dept., Cornell University, Ithaca, N. Y.

Wanted—Names and addresses of collectors of insects, particularly Lepidoptera. Those from foreign countries especially invited. Will pay cash or exchange. Peter M. Casamento, P. O. Box 276, West New York, New Jersey.

Exchange—All groups of Lepidoptera in exchange for Noctuidae of the World. Foreign correspondence desired. A. Glenn Richards, Jr., Roberts Hall, Cornell Univ., Ithaca, N. Y., U. S. A.

Exchange—Lepidoptera of the Northwest for beautiful and showy exotics. C. W. Herr, Priest River, Idaho.

WANTED for cash or in exchange, hibernating pupae, especially Papilios, Saturniidae, Eacles imperialis, Autom. io and others from all parts of the States, Canada and Mexico. Send lists with best prices to Max Rothke. 1846 East Elm St., Scranton, Pa.

Mordellidae from all parts of the world wanted for special study. Will determine, exchange or purchase. Emil Liljeblad, 1018 Roscoe St.. Chicago, Illinois.

Exchange—Will exchange California Butterflies for any of your locality. What have you to offer? Correspondence solicited. John Imschweiler, 748 N. Eucalyptus Ave., Inglewood, California.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA, PA.

COLEOPTERA

M-6.—**Rivnay** (R.)—Revision of the Rhipiphoridae of North and Central America. (Mem., no. 6, 68 pp., 4 pls., 1929) 2.00

DIPTERA.

929.—**Cresson** (E. T., Jr.)—Studies in the dipterous family Ephydridae. Paper 2. (Trans., **55**, 165-195, 1929) ..... .65

935.—**Cresson** (E. T., Jr.)—A revision of the North American fruit flies of the genus Rhagoletis (Trypetidae). (Trans., **55**, 401-414, 1 pl., 1929) ..... .30

HOMOPTERA.

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